TITLE: BRAZILIAN CERRADO SOIL MICROBIOME: DIVERSITY AND BIOTECHNOLOGICAL POTENTIAL

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ABSTRACT:

The Cerrado is considered one of the broadest regions of Brazil, covering about 25% of the Brazilian territory. Although it presents a dense water network, its soil contains low nutrient and low pH, resulting in a forest, savanic and countryside vegetation patterns. Studies related to this biome began in the 80's, however they are scarce, particularly in Microbiology field. The aim of this study was to conduct a bibliographical survey about the diversity of soil microorganisms in the Cerrado biome and present its potential in biotechnological applications. CAPES and Scielo databases and data available in National Ministry of Environment were used. Based on studies conducted in the Cerrado soil using Molecular identification techniques, the dominant phyla of Bacteria domain were found to be Acidobacteria and Proteobacteria. Fungal diversity studies are still poorly explored, and Ascomycota Phylum was predominant. In Archaea domain, a recent study observed especially the Crenarchaeota phylum. Some studies have demonstrated the biotechnological potential of some bacteria isolated from the soil in and its presumable application in agriculture. Some examples include *Rhizobium* associated with bean, maize, sorghum and *Cratylia aegentea* (used for reforestation in degraded areas), as well as *Azospirillum brasilense* associated with corn and sorghum, favoring an improvement of these crops. In addition, utilization of *Bacillus* spp. in rice cultures provided growth and controlling of pathogens *Sclerotinia Sclerotiorum* and *Rhizoctonia Solani*. Arbuscular mycorrhizal fungi isolated from the cerrado soil were used with *Jatropha curcas* L. (Pinhão-manso) in degraded areas of the Cerrado, and soil quality was improved after 12 months. In health research field, antimicrobial activity of *Actinoplanes* ssp. and *Penicillium clerotiorum* against Gram positive and Gram negative bacteria as well as yeasts was observed. In addition, some sporogenic bacteria were able to eliminate *Culex quinquefasciatus* larvae after 24 hours of inoculation. However, more studies are still need even though of the high equipment cost for microbial molecular characterization. As observed, commercial interest is still far from being achieved, but the application of microorganisms in different research areas is promising.

KEY WORDS: Microbiota. Microbial diversity. Biotechnology. Microorganisms